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June 1966 Nos. 35 & 36

PEACE IN THE SCIENTIFIC AND TECHNICAL AGE

By

Günther Howe & Heinz Eduard Tödt (Germany)

Note to the reader:

Many papers have been received from individual scholars and study groups in different countries as contributions to the discussions of the subject "Christians in the Technical and Social Revolutions of our Time", which is the theme of the World Conference on Church and Society, in Geneva, July 12th-26th.

We are able to make a few of these available to the conference participants and our friends around the world. The paper by Prof. Tödt and Dr. Howe of the University of Heidelberg was published by Kreuz-Verlag in Germany and entitled: "Frieden im wissenschaftlich-technischen Zeitalter". We are grateful to Mrs. Tödt who has translated this interesting study into English.

Dr. H. E. Tödt is Prof. of Social Ethics at the Theological Faculty, University of Heidelberg.

Dr. G. Howe is leader of a study by theologians and scientists in Heidelberg, concerned with questions of theology and science.

Background Information is published six times in 1966 to promote ecumenical discussion on social issues. It is compiled by the staff of the Department on Church and Society of the World Council of Churches, but does not necessarily represent the views of the World Council or its staff. Background Information may be quoted only with direct permission.

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PREFACE

Günther Howe fell seriously ill after finishing his part of the first draft of the following papers. The revision had to be taken over by the other author who, to be sure, will never be as competent for fields like the history of technology and natural sciences as Howe is.

The completion of these papers coincides with the publication of Schema XIII adopted by the Second Vatican Council. This Schema challenges the church to enter into a dialogue with science and technology and endeavours to prepare for it by internal criticism. In the Roman Catholic church, the dialogue has still to begin. As a natural scientist and a theologian, we tried in our papers to reflect on the beginnings of a dialogue. We know only too well how difficult this dialogue is. The difficulties will certainly show themselves in the following pages. Much more than what we present here must be considered. We restricted ourselves to the confrontation of ecumenical theology with problems which arose in natural sciences and technology. Readers who may miss other fields, especially the social sciences and philosophy, have the authors' sympathy, but we have concentrated on a limited number of considerations. This obvious incompleteness will, as we hope, arouse constructive criticism and new endeavours.

For the next Assembly of the World Council of Churches in 1968, we plan a more extended publication on this topic. The sources which we use here will be quoted in detail then, and more consistent relations between the problems should be achieved. Papers as short as the present one tend to have more of bald assertion than of substantiation in their style.

The considerations gathered on the following pages have mostly grown from dialogues and cooperation in the "Evangelische Studiengemeinschaft", Heidelberg, Germany. C. F. von Weizsäcker, Georg Picht and Wolf Häfele have especially shared in the work of reflection. Related problems were discussed in seminars and lectures held cooperatively by both authors at the university of Heidelberg. Students and assistants contributed suggestions and criticism. Dr. Ilse Tödt, Ph.D., did most of the checking and translating.

Heidelberg, March 1966

Dr. Heinz Eduard Tödt, Dr.Theol.

THE RESPONSIBILITY OF THE ECUMENICAL MOVEMENT FOR SCIENCE AND TECHNOLOGY IN THE COMING WORLD COMMUNITY

By

Günther Howe
Heinz Eduard Tödt

I. INTRODUCTION

Because all societies live in a common history today, there stands before us the quest for the spiritual and social basis of life in a coming world community. This is the thesis which the Central Committee of the World Council of Churches has made the focus of the World Conference on Church and Society in 1966. Indeed, there is a "Christian universalism", namely the belief in the redemption of the one world through Jesus Christ. The World Conference at Evanston proclaimed: "Christ - the Hope of the World". This universalism encourages all churches to participate in the building of a world community. But on what basis do we speak of a coming world community? As we look at the actual political and social situation on our globe, we might well think that this is mere wishful thinking.

There are two systems of political power which tend to regard their policies as mutually exclusive, and neither of the two thinks it right to give way to the other. There are highly industrialized and partly or non-industrialized countries, and the gap between their standards of life grows more rapidly than it can be filled. In already heavily populated areas, the population increases at a higher rate than industrial production, and education which would prepare for intensified industrialization lags behind. Those countries which are still far from modern industrial production, however, are no longer disposed to passive and patient acceptance of that which now seems unavoidable. They are keen on helping themselves now, and in trying to do so may be inclined to think only secondarily of the rest of the world. This carries no great promise for world peace. Nor does the tension between the Great Powers open peaceful prospects. Both sides possess means of annihilation great enough to destroy civilization in the most fertile areas of the world. Slight provocations could tip the scales and destroy the balance of nuclear power. After the resulting catastrophe, a world dictatorship more totalitarian than any previous dictatorship might sprout from the rubble of civilization.

The U.N.O. as a world organization struggles to stabilize the social and political balance. But it does not yet possess either the world-wide loyalty or the legislative and executive power of an effective world government. The indispensable work which it does is handicapped by the inadequate means which it has. Yet the future appears to offer us the choice between a world dictatorship of that Great Power which was less completely annihilated and the moral, legal, political establishment of a world community within which conflicts do not burst into war and revolution, but are mastered in peace.

There is no way around this alternative, as far as we can see today. The trend towards crisis and annihilation seems the stronger one unless

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humanity energetically gathers its strength in an "extraordinary moral exertion" (C. F. von Weizsäcker). It is realistic thinking which stands behind the Ecumenical Movement's quest for the basis on which a coming world community can be erected. We must establish it if we do not want to drift into overwhelming catastrophes. Thus the churches ought to view this prospect, without fear and without illusions. Only when they do not evade the present and future realities will they be ready to show the world what it means to believe in Christ as the world's only hope and what this hope means for the realization of the tasks given by the contemporary situation of the world.

II. Ecumenical theology today and the problem of a world community

Is the Ecumenical Movement prepared to realize what has to be done in the world as it is now? Can it count on a theology, on social ethics, on a programme of action in which a coming world community is taken into consideration? Certainly, "Christian universalism" finds ever stronger expression in the churches belonging to the Ecumenical Movement. But how relevant is ecumenical thinking to the urgent tasks of today and tomorrow? And how far might it be hindered from perceiving them by traditional points of view which determine its outlook but are now inadequate? We shall pursue this question in three fields; first, the postulate of "responsible society", second, the attitude of the Ecumenical Movement toward Marxism/Communism, and third, the problem of secularization.

1. The postulate of "responsible society"

W. A. Visser t'Hooft has recently called the basic consensus about the significance of "responsible society" one of the most promising results of Ecumenical work in the past decades. This concept was indeed significant in view of the crisis of democracies all over the world during the 1930's. The world-wide economic crises and other difficulties arising within the democratic order of society had been siezed upon by a number of totalitarian social and political systems whose behaviour steered toward the Second World War. The Ecumenical Movement responded to this challenge at the Oxford Conference in 1937 by laying the foundations for a new Christian social ethos. In 1948, at the conference

in Amsterdam, these deliberations were crowned by proclaiming the postulate of "responsible society". Because this axiom developed as a response to the challenge of totalitarian systems, it is subject to being understood as an allignment with democratic thought and action, especially in the spirit of Anglo-Saxon democracies. This means that the postulate appears less universal than a social concept should appear today.

Theologically speaking, the deficiency of the postulate is its inability to establish a convincing connection with Christian eschatological universalism. The political-social activity of the Ecumenical Movement tended rather to follow pragmatic lines, or to be oriented toward a certain concept of universal moral law, a natural law of morality. As Ecumenical activity extended beyond the bounds of the Anglo-Saxon or Western way of life, the handicap of a certain particularism was felt. The postulate "responsible society" is often inadequate for Christians in the new nations which go through revolutionary social and political change. Western democratic institutions and ideologies cannot simply be shifted to countries where social, political and intellectual conditions such as they presuppose are missing. In many cases, such an attempted transfer without modification would appear as tutelage. For non-Western Christians the postulate "responsible society" may indicate a faraway goal but it does not seem to apply to the actual social-theological problems like the theological foundation of a Christian minority's cooperation with a majority whose faith and political views the Christians do not share. It is likey that such problems will be very real in a world community within which Christianity will figure as one of several large religious groups - one particular cultural association with a specific tradition among many similar associations in the pluralistic system of a world civilization.

The limitations of the concept of "responsible society" were already clearly apparent at the Amsterdam conference. Karl Barth and Hromadka especially concentrated their theological attention upon the situation of Christians under communist rule. This made them differentiate between ethics in Western democratic surroundings and Christian precepts for life in a communist society. The mere fact of such a differentiation set these theologians off from those participants of the conference who acceded to the way of thinking of, for instance, John Foster Dulles.

It will be necessary to consider the problems of Amsterdam anew. In a world community, Christians will doubtlessly cooperate with governments, parties, movements, religions, and groups which are non-Christian, or even anti-Christian. If we do not see any social-theological grounds for such cooperation, Christianity will not contribute much to the building of a future world community.

2. Ecumenical criticism of communism

The lines on which communism would be criticized in the Ecumenical Movement were laid down at the Oxford conference, and were extensively pursued in Amsterdam. Later conferences scarcely added new points to those discussed there. The criticism of Amsterdam was not only negative. In a surprising consensus indifferent to the ideological controversy ranging from Dulles to Hromadka the communist conception of society

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was affirmatively evaluated. The economic system and social policy of communism, so far as they aimed at a more righteous solution of social problems, were accepted as the valid background against which the points of reproach stood out: totalitarianism in social policy, arbitrary violence, amoral ethics, materialistic anthropology, and atheistic philosophy. Was it enough, however, to judge communism only from this background?

In 1948, Hromadka called the social spirit of communism a secularized Christian theology. He held that communism did for the poor what the church should have done. Other critics also affirmed that the anti-capitalistic striving for social and economic justice verged on the Christian understanding of righteousness. Since 1948, however, it was its humanitarian social ethos that Soviet communism was least successful in measuring up to its expectations. Observers from all over the world could not but notice that, even though the traditionally privileged classes had gone, new priority groups had arisen. The spirit of a more righteous social system has turned out to be shallow.

Nevertheless, the appeal of communism for certain countries has not diminished. The reason for this lies outside the considerations of Amsterdam. Many regard the USSR as an example of the dynamic answer to pre-industrial circumstances. In the USSR, an educational system, at all levels and for everyone was built up with almost unimaginable rapidity and intensity. From this effort extraordinary achievements in technology and science have resulted. The motive is not so much the humanitarian intention to provide the living generation with all that human beings need for life. It is rather a passion for changing the world by means of science and technology. Lenin's dictum, "Communism means Soviet power plus electrification of the whole country", is spoken with this spirit. "Electrification", or, to speak more broadly, creation of new technical conditions, was already a matter of more consequence to Lenin than was observed by those interested mostly in morals and religion. At Amsterdam, the communist ethos of changing the world was hardly noticed, or was criticized only negatively as connected with the materialistic understanding of man, the sinful intention of atheistic self-emancipation of man, and so on. The dominant stress on morals in the theology of that time may have obstructed the view of communism's dynamic efforts to civilize. The powers of changing the world, which were at work in communism and promised much for the future, obviously were not perceivable from a Western Christian understanding of a moral universal law from which any digression inevitably meant corruption. This is also evident from the fact that the Amsterdam conference only mentioned the dynamic civilizing powers, technology and science, in passing and only incidentally treated them theologically, that is mostly in terms of their possible inhuman consequences. If there is a one-sidedness underlying the Amsterdam perspective, we must overcome it at the Geneva conference. We see now the inhuman consequences of neglecting technology and science. Not only the way of life of the individual nation depends on its technical-scientific development, but the similarities among the different nations increase as the ways of thinking and acting in terms of technology and science gain influence. These similarities might serve as part of the basis for a coming world community. However, we should not leave out of account that this same increase of similarities can evoke tradition-bound emotional reactions which might interfere again with the development of a common basis

3. The discussion of secularism

In the Ecumenical Movement, the relationship of the Christian to the technical-scientific civilization has been discussed mainly as a problem of secularism. Under this catchword, theological statements were made about the self-emancipation of modern civilization from old traditions. The World Mission Conference of Jerusalem in 1928 saw an antithesis between such amancipation and Christianity. Secularism as the mental attitude conforming to secular civilization was regarded as a pseudo-religion, as the greatest modern rival of Christianity. It followed from this that theology could not judge technology and science otherwise than negatively. Even at Amsterdam, Oldham declared: "The widespread belief that the strongest hope for a restoration of the social order rests on a development of knowledge and technical skills is the strongest rival of Christianity in the world of today." The conference at Nyborg in 1959 arrived at a different judgement. The process of secularization, of which Christianity is one cause, is both good and bad. It is welcome so far as it retracts the process of mythicizing and sacralizing life, which is contrary to Christian belief. It is dangerous so far as it drives man to spiritual decay and corruption. Similar statements were made at the World Mission conference of Mexico in 1963, especially by the Indian, M. M. Thomas. However, the new way of understanding the conditions of civilization produced by technology and science gains ground only slowley in Christian interpretations of the modern world. Theological insights traditionally had as their centre sin and atonement. Now, the centre must be somewhat shifted. We may show this by a brief reference to the theological concept of sin.

The technical-scientific emancipation of man is traditionally understood as a direct expression of rebellion against God, as sin. That is also the point in the sentence of Oldham already quoted. But Oldham did not intend to interpret man's will to change the world only as a diabolical rebellion of man against his creator. He quite clearly recognized a deep dialectic here. The traditional dominance of the concept of sin, however, hindered him, and still is a hindrance, to discerning the full extent of the achievements and possibilities of technology. If emancipation from God and his universal moral law is understood as sin, which always means disintegration of the social order and perversion of the personal relations of human beings, one cannot expect the dynamics of the scientific-technical powers and the corresponding attitude of mankind to have any other effects but destructive ones. Owing to the logic of connecting the concept of sin with the universal moral law, Christian preaching and Ecumenical statements frequently warn against technical-scientific endeavours to change the world and rarely say anything affirmative about them. Yet, if science and technology were to break down, a great part of the population of the earth might starve. It is evident from this simple fact that what is currently understood as sin needs renewed and deeper theological reflection in order to eliminate those elements which lead to so questionable a result. At the Mexico conference in 1963, section II pointed out this need, though without mentioning the concept of sin, by declaring: "Secular structures have a God-given function."

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To sum up: problems of the technical-scientific civilization have been under discussion in the Ecumenical Movement, but a theological understanding of these problems in world-wide perspective was constantly hindered. The postulate "responsible society" aimed at an Ecumencial ethic for all the world. It was, however, tied to a certain Western democratic Christian mentality. Thus, for example, it prevented an appropriate judgement of the systematic civilization creative ethos characteristic of communism. And the dominating influence in the Christian churches of a tradition-bound concept of sin for the evaluation of an emancipated secular civilization led most of them to the rejection of the modern scientific and technological spirit.

Objections to this situation have been raised at all times, and recently, especially noteworthy ones; there have been attempts to determine the connection between Christian eschatology and Ecumenical ethics that had been missing. This endeavour is clearly perceivable in some of the papers prepared for the World Conference on Church and Society in 1966. Therefore we now want to scrutinize the relationship between such eschatological considerations and the problems of science and technology.

4. Aporiae of eschatology and ethics in Ecumenical theology

a) Evanston and the earlier problems of eschatology.

The conference at Evanston was a grand endeavour to discover and confess before the world, the unity in the manifold and often contradictory expressions of Christian hope. It is a landmark on the road which the churches in the Ecumenical Movement have taken. However, the problems dealt with here were not solved at Evanston.

A convincing relationship between the postulate "responsible society" as the main principle of Ecumenical social ethics, and eschatological universalism was not achieved. Between the eschatological testimony "Christ - the hope of the world", and the pragmatic activity remained a gap. What did it mean for the actual tasks to be done on earth that Christ as Lord of the world is the hope of the world? The connection was not clear. Why was it so hard to speak concretely of the eschatological expectations of Christianity?

The theology of "Kulturprotestantismus" in Europe and the social gospel theology in America had held that Christian activity on earth could merge immediately into a realization of the Kingdom of God as an historical goal. This belief engendered an optimistic ethics of worldy activity. This optimism was shaken, however, by the experiences of Christians with themselves and with non-Christians in two world wars. During this same period, more precise New Testament exegesis showed that the Kingdom of God, understood as the good towards which all Christian expectations are directed, is not brought about by men but by a new creative act of God. If only God's own action will finally bring about His reign, if the only relevant hope is that which concentrates on this action of God, must not all other hope be irrelevant because it is earthly, human and thus finally an illusion? Must not all human activity which endeavours to influence the course of history end in condemnation and futility?

The basic structure of every Christian credo is to give the glory to God alone. So it is a good doxological truth that the creative action

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of renewing the world can be expected from God alone. But Christian ethics cannot drown in this credo. It rather emerges from it to pose the question of how the will of God can take shape in the context of the activity of the Church and the Christian life (Romans 12, 2), and how the Christian cooperates on earth, in the creative activity of the living God, in the right way and with the right outlook. No answers to this question can be found in supranatural eschatalogy. We do indeed confess that our great hope in God's action releases us from this world, and from this great hope will somehow spring the little hopes of men in history. But the goals which these little hopes may or may not have in the world are no longer explicable. Thus the suspicion arises that Christian hope means nothing outside the spiritual life of the individual, or the spiritual life together of Christians within the Church. Christian hope, would then provide no basis for responsible action in world events: it would be limited to the spiritual event in the believer.

Christian hope cannot be restricted to the individual believer. But the many voices raised in the Ecumenical Movement in protest against such a restriction were unable to disprove the exact exegesis which had established that the men of the New Testament had never conceived of a conscious forming of human society and civilization. Only the chiliastic movements had an indirect tendency towards what we today call "changing the world". They stressed the reign of the righteous with Christ (cf. Rev. 20, 1-6; I Cor. 6, 2; Matt. 19, 28, and other passages). These New Testament sayings, however, cannot be interpreted as commands to shape civilization. Is the conscientious exegete, then, a prisoner of the alternative between a supranatural eschatology which offers no theological ground for concrete Christian responsibility in the world, and a pragmatic Christian activism whose identification of earthly ends with the end of Christian hope is theologically inadmissible? During the last decade, theology has suggested two different ways out of this prison. We will sketch them now.

b) Dynamic rather than static thought

The expectancy of God's eschatological final act often induced a "conservative" attitude. For, if God's future act is all that matters, it seems needless to change or revolutionize earthly conditions. Doubtless we can find in the apostle Paul's writings a "conservative" tendency to leave social conditions as they are, the time of the world being far spent anyhow. We should not overlook, however, that Paul understood the Christian Church's future as utterly dynamic and universal. In this respect, he was not at all "conservative". Aware of the dynamic gathering of the people of God into the Church, Paul still did not entertain any revolutionary designs for the social order. Such ideas which to us look self-evident had not yet arisen. Hence we can neither simply copy Paul's social conservatism in our times, nor reproach the apostle for neglecting revolutionary dynamic thought.

At present, conditons have been directly reversed. Paul's dynamic view of the Church had often become rather static. The social order which was static then is now dynamic and revolutionized so that modern time suggests a forward plunging process without stable structures. In the present situation, man can no longer look to tradition and past history for orientation but must grope his way into the future. Man tries to grasp those means which apparently guarantee effectiveness in the processes of change in order to be able systemically to shape his earthly future. No leading ideas can be found for this activity in transcendental eschatology. Nothing is bidden, nothing forbidden. There appears to be no relationship with action to change the world.

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In other Biblical passages, God's future activity is less strictly separated from the course of history than in Paul's writings. The prophets of ancient Israel, moving outside the traditional institutions and ways of life, announced the great coming crises of God's judgements. They understood God's activity mainly as dynamic action in the future which would also modify the situation on earth. The Messianic expectations were likewise directed towards the promised future changes of the earthly situation. If Israel, therefore, lived in the movement from God's promises, which were again and again renewed, towards their filfilment, then her situation was anything but perseverance in the status quo. From that perspective Israel's history might be interpreted by phrases like "God's political activity", "God's humanizing activity in history". If this was true of Israel, it might be said also of modern Christianity: we have to be God's itinerant people, an exodus community, being on the road and expecting God's ever new action and help in the future. When Christianity understands itself in this way, it is predisposed to cooperate productively in a world of revolution and dynamic change. It would moreover have to actively vanquish all static positions and make them dynamics in order to make room for an exceeding righteousness and a greater freedom, precisely in the search for the Kingdom of God and His righteousness.

Considerations like these are a good counterweight to onesidedly static thinking in Christianity. They are not, however, a fully persuasive way, to surmount the alternative between supranatural eschatology and human action. Even the prophets who announced God's political activity were convinced that God alone would bring the great changes to pass, that the Lord Himself would call the peoples as instruments and would let them be smashed like earthenware. The prophets were far from thinking that such dynamics could be brought about by men's actions on their own initiative. They did not speak of a purposeful cooperation of men with God's activity in history. They bore witness to God's future action concerning His people and the peoples, but they did not organize human action with the aim of changing the world dynamically. Here in the Old Testament no solution is offered for the problem which the Ecumenical Movement must try to solve, how the great hope for the Kingdom of God should be transformed, on principle or even actually, into the little hopes here on earth. The dynamics of modern civilization are brought about by men; they play a highly active part on their own responsiblity. This was not in view when the prophets announced "God's political activity". We cannot immediately equate the situation and the future of the covenant people of Israel with the situation and the future of world civilization today. In the meantime, all hope has been dee ply changed by the life, death and resurrection of Jesus Christ.

To introduce dynamics into Christian thinking by reference to the Old Testament is open to still another question. Can the consistent purpose of action be the transformation of statics into dynamics for dynamics' sake? Rather, is not the necessity of dynamic transformation relative to certain situations and epochs of history? If under the given political and social circumstances a large section of the population of the earth lives in want, Christianity has every reason to oppose the stabilization of these circumstances and for starting those dynamic processes that might bring help. But dynamization is not an eternal value. It is a temporal task which in fact may recur in different ways and in different spheres. The dynamics of civilization is not to be understood as "Messianic dynamics".

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c) Futuristic orientation of eschatology

The second line of theological argument towards an "eschatological ethics" which we want to sketch presupposes that the future ranks before the other dimensions of time. The Church proclaims that the Lord's future is greater than any present time. It will fulfil what has not yet come. It will bring the epiphany of God's entire glory. Must not Christians then give precedence to the future development of the world, not to the state in which it is now?

In divers variations, this argument is combined with evolution and other philosophies of history which emphasize the future. Thirty years or more ago, some theologians in the USA used "futuristic" considerations in trying to creat a bridge to some elements of Marxism. The same is happening in Europe today. Of course, these theologians are not concerned with vulgar totalitarian expressions but with a philosophical view of Marxism as held by Georg Lukacs, Ernst Bloch and others. To counteract the thesis that the same will always recur, because man is not really able to change the world and to increase his possibilities, their basic ontological thesis is that the world is not yet complete but looks forward to its completion. Man's task is, not only to humanize himself but to help the world in "bringing out" what is still concealed but strives to come to light.

On the road of history from the still unfinished reality towards the completion of the world, Christianity is given a special task. Directed toward God's future, it has to help in the creative expectation of changing the form of the world. Its cooperation for the promised Kingdom of God will even reveal itself finally as the activity which brings the world to completion, to perfection. Christian expectancy and world-forming humanistic activity thus are directed toward an identical future. During the process of history, hope changes the world, and the certainty of the forgiveness of sins and of being children of God which is given to the faithful releases them for this activity.

We will stress later what indispensable truths we see in this way of thinking. Here, we raise critical objections. The central idea here appears to be a Christian explanation of Karl Marx's thesis: We have not only to interpret, but to change the world. According to the Christian explanation, we are to change the world expecting changes of it from God. This changing would be the eschatological process of the world, of history, of humanity, in which the Lordship of Christ is not only testified but also portrayed. In this way of thinking, Christian "practice" mediates between Christian ethics and the eschatological dynamics which come only from God. However, is this mediation theologically a legitimate one? Can (or must) the Christian understand the revolutions and dynamics which man has brought into history as directly connected with the eschatological changing of the old aeon? In the Pauline ethics, such is not at all the case. This ethics summons the Christians, in view of the eschatological hour which is drawing near, to be subject to the powers which there are and to do what all men must consider as good, acceptable and righteous. Christians act in the knowledge of their obligations to those among whom they live. They act according to the renewing of their mind which transforms them so as to discern now what God's will is and what corresponds to the love which the Spirit brought into this world (Romans 12, 2; 13, 9).

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Paul does not especially emphasize the earthly future and the social conditions which should be attained in it. Even in Romans 8, 18 ff he does not speak of any future attainment. The apostle does not give precedence to the future on earth because the reconciliation of the world has already happened through God's presence in Christ (I Cor. 5, 19). God's saving action in Christ has happened. Hence, neither dynamizing nor stabilizing worldy conditions is the direct task of the Christians. Rather their mandate is to discern in freedom the action they owe in the Spirit of love to the world around them on its way into the immediate future. This means neither the abolition of the present good for the sake of a hypothetical future, nor the abandonment of new possibilities because of a presumedly absolute present.

What accordingly could be the attitude of a Christian towards the sciences which are changing the world into its future? No salvation can be expectedfrom change as such. We hope for salvation on the grounds of the message of Christ's redemptive death and resurrection. He who hears this message knows something of God's plan for salvation. But God's plan of salvation revealed in Christ is not identical with God's plans for civilization. Christians should take care not to induce the impression that they occupy a seat in the rule of God and enjoy an insight into His plans for civilization. We have to distinguish carefully between God's plan for salvation, to which the message of Christ is witness, and God's plans for the world which are unknown to us. But this distinction does not imply that there is no relationship at all between the two. On the contrary, we must inderstand the true correlation to answer the question on how the Christian's hope for salvation is connected with his responsibility for civilization.

III. Eschatology and responsibility for the world

1. God's worldy activity and a universal moral law

We have been led to the question: Are the Christians justified by their eschatological hope in proclaiming hopes for civilization? May they announce a hopeful future to the peoples which are threatened by weapons of mass annihilation? Or may they, at least, give promising prognoses under certain conditions?.

In the Roman Catholic church as well as in the Ecumenical Movement, the following condition has often been stated: "If only the peoples return to God's universal moral law and keep to it, they will live and be healthy." But this condition does not fully do justice either to Christian theology or to the situation in which the world is at present.

Large parts of humanity today cannot fulfil such a condition. Is conversion to a moral law, in the religious sense of a worldy order which God has revealed and to which He has bound Himself once for all, the necessary precondition of the existence of political and social orders? The Roman Catholic Church teaches that religion is the indispensable support of political order; the modern state which does not decide for a religion but remains neutral is because of its lack of religion worse than the religious state of heathens. Accordingly, democracy is criticized for its religious neutrality. It is considered as a form of political and social organization which, without the support of religious, especially of Christian religious powers, would be unable to keep the common life in order. The experiences of modern states or societies, however, do not confirm this criticism. Indeed, communities cannot exist without certain moral attitudes of their citizens. But morality in this social-political sense does not necessarily presuppose religiosity. In the irreligious marxist society of the USSR a morality has developed which obviously keeps up the present political order. Some elements of this morality of Marxism - even in parts of the so-called "Moral code of the builders of communism" which was proclaimed under Kruschev - look universally human and do not contradict Christian ethics. Though a superimposed communistic ideology commands implacibility against the enemies, these universal moral elements might yield a basis for partial cooperation with Marxists in a coming world community. A world community can live in peace only if that section of humanity which is ruled by a Marxist ideology also participates in it. Probably, divergent views on how life in a community should be ordered will continue to exist. So we have to find an order of life which can bind such divergenices together and channelize and control conflicts in a rational way. This will not be eschatologically speaking a final order of peace. The claims of a universal moral law as Christians have accepted it will certainly not be fulfilled. One should first of all pay attention to any element on which a community might be established, and try to make the best of it. There are and will be Christians who believe that God's reign, even if concealed and indirect,also reaches into Marxist social and moral views.

That brings us to the decisive theological reason for not allowing Ch Christians to assume that a complete given universal moral law revealed to Christianity ought to be accepted as the basis for any future world community. According to Biblical witness, God without detriment to His

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omnipotence over man has continually proven Himself as He who permits men to oust Him from their life and world, and yet to remain present in the world. The world remains under God's reign, even if He is not acknowledged. God's almightiness is not reduced by men's not recognizing Him. God gives the man who rebels against His will room to live, He as the judge gives him time and thus offers him grace. God's activity toward man and the world is not fixed by a logic of retribution, He is not bound to react on the basis of man's rebellion or obedience. God acts in the world in a way which we cannot predict, since it follows both His freedom and His love. Jesus Christ who is the fulfilment of all law is not rewarded before the world by life and peace but is delivered up to suffer, and thus lifted up and raised as the Redeemer of the world.

Of the theologians in our times, Dietrich Bonhoeffer may be the one who can best help us to consider God's activity in the modern world under this aspect. His thesis is: The life to which Jesus summons us is participation in God's powerlessness in the world. Referring to Jesus' affliction at Gethsemane, Bonhoeffer declares: "Christians stand with God in His suffering". Christians trust in God not as in one who will almightily enforce a world plan or a universal moral law known to them. Rather they trust in God who wills to be powerful in suffering His powerlessness in the world, thus being the one and only Lord of the world. Because they believe in this God, they are empowered to reject man's dynamic changing of the world, in the sense of bringing about its final perfection, and to strive nevertheless with all their heart for a temporary imperfect order which creates the conditions for survival in the technical-scientific age.

2. The cooperation of man in God's worldy activity

What is inferred from Bonhoeffer's thesis can also be considered by means of the traditional theological concept of cooperatio dei cum homine and cooperatio hominis cum deo. According to the New Testament, men are labourers together with God in bearing witness to the message of salvation (I Cor. 3, 9 and other passages). During the history of the Church, Christians often tried to extend their cooperation to God's worldly activity. Cooperation in this respect, however, presupposes the Christian's ability to know the way, the order, and the aim of God's activity in the world.

But how shall the Christian gain such knowledge? This was no unanswerable question as long as the order of the given world was regarded as created by God. The natural law, which represented the order willed by the Creator, then set the values for man's cooperation in preserving the world. But this natural law understanding of the world can no longer be maintained. The traditional structure of society has dissolved. Man has become conscious of the autonomy of his knowledge and will. Now it is impossible to identify any given order, or any given trend, in a protoligical or eschatological manner with the will of God as loving and reigning the world. God's worldly activity is concealed from our knowledge. We can no longer understand ourselves as labourers together with God with respect to the world. Conservative activity can no more refer directly to an order of the world as created by God, and revolutionary activity cannot directly refer to the promise of a new heaven and a new earth. The Biblical message states neither that the final order of the world is already here, nor that the eschatological new world of God will be brought about and promoted by purposeful activity of Christians.

We are not to believe that we experience a direct revelation of God in Christian "practice", whether in upholding or in changing the world. To believe in Jesus Christ means to be prepared first for another experience, that of participating in His suffering on earth and His being forsaken by God on the cross. Only afterwards, the knowledge will arise that in Christ that love is revealed which gives life and light even to those who oppose God and are judged by Him. The boundary of man's cooperation with God's activity toward the world is drawn by the cross of Christ. Believing in Christ, the Christian may participate in God's suffering on earth, and in that love which reaches further than this suffering. God's worldy almighty action which uses the services of all men, even without their knowing and against their will, is however concealed from the Christian's sure knowledge. We cannot see the cooperatio dei cum homine, but we may believe it.

This belief without the pretension of seeing deeply distinguishes the cooperation of Christians from an agnosticism which might draw the consequence that, since nothing can be known of God's worldy activity, man should do nothing. Our faith gives us the certainty that our individual human services in worldy institutions which must be constructed by men and are thus "open-ended" will be used by God according to His will, and that it is His will to use the worldy services of individuals as well as of institutions (Romans 12, 1 & 2; 13, 1-7)

3. Knowledge of God and responsibility

If man cannot see the aims of God's worldy activity, if man has no insight into the total plan of the world, if, consequently, he is not able to act in knowledge of such a plan, he must act in terms of what he as a human being is able to know and to do. Within the bounds of the possibilities of human knowledge and activity, man must take the responsibility for what he knows and does. This means: Man is called to come of age. It does not mean self-glorifying and autocratic autonomy. Human possibilities are not limitless. Man is not absolutely master of everything including himself, and he knows it when he has come of age. The real theological issue of modern times is not man's absolute autonomy, but, in the words of Bonhoeffer, "the world come of age is claimed by Jesus Christ".

A world come of age, in the sense in which Bonhoeffer uses the phrase does not cherish the illusion that God's rule over the world is open to human view. This is shown by giving up that worship of God which had aimed at guaranteeing the basis of some existing political order. Hence, it will readily do without a league of world religions which only has the aim of guaranteeing the basis for existence of a coming world community. Likewise, Christianity must do without such a league if it has this special aim, because unnecessary boundaries would be erected by it, for instance against the "non-religious" humanists. Christians who have understood the structure of a world come of age will not proclaim an ideal of religion or Kingdom of God as the basis for world civilization. A God who can be affixed to innerworldy structures and will stay there, certainly "is dead", as Nietzsche said. Christianity does not believe in such a God. It does believe, however, in the God who in Jesus Christ suffered from and in the world, yet claims it as the world coming of age.

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A Christianity which does not see into God's plans for the world but believes that God gives life even through death, feels unjustified to proclaim hopeful prospects for the civilization of mankind. Its exercise of reserve in this respect, however, demonstrates neither pessimistic feelings of anxiety for the world, nor a quietistic stance of inactivity. It rather directs men to their own responsibility for seizing or not seizing possibilities of winning peace for a coming world community. Men who follow this direction come of age. Their attitude in the world corresponds with Christian knowledge of God.

4. Maturity

By the concealment of God's activity in the world we have been put under the necessity of coming of age. We have to take the responsibility for what lies in our power. We must find the ways and aims of our worldy activities on our own responsibility. As Christians, we believe that it is God's will to be at work on earth in using men come of age, and we do not mistake maturity for autocratic and self-glorifying autonomy.

We must act as men come of age, but we have not yet attained maturity. This deficiency is obvious in the way science and technology are managed at present. In certain respects, modern man already demonstrates his maturity, for instance when he changes the surface of the earth according to his plans. In other respects, he dangerously demonstrates that he is still under age, for instance when, regardless of the actual conditions, he cultivates a "pure" science which disclaims all responsibility for the consequences of the knowledge it gains, and neglects to cultivate scientific methods for the cooperation of the sciences. Man's attitude towards the technical-scientific civilization is ambigious. He knows that he is its creator, but he does not fully realize that he has to control it, or how he could control it. This is an example of man's being of age and yet under age. We have to take account of this double structure. It is mere "scientism", blind belief in science or progress, if one expects that all problems will automatically be solved as science carries on. It is blind belief as well if one denies with theological or philosophical arguments engendered by a tradition-bound attitude, that there is any necessity for men to act in the responsibility of maturity.

To the knowledge of him who acts, nothing is decided once for all over the worldy future of humanity. The future is "open". We should not simple infer from this a challenge to unstable reflections and shaky prognoses. We should rather understand that this means room for responsible human activity towards ends which Christians would be the last to call final. As far as we know, our activitiescan not bring about the order of God's new world. We must work towards temporary ends in this world. Today, peace for a coming world community appears to be such an end.

The activity towards a temporary end remains an "open" activity. He who acts knows that his greatest exertions do not guarantee success. He will strain every nerve to think out, plan, prepare and bring about

the necessary pace. At the same time he will not forget that man is not the absolute master of either himself or of his scientific and technical possibilities. Illusions which cover up the inadequacy of human means for the task of bringing about world peace can only aggravate the dangers.

These considerations concerning ethics in a world "come of age" embrace, as it seems to us, important elements of the ecumenical social-theological concept of "responsible society". This concept was defined in Amsterdam as follows. In a "responsible society", freedom is the freedom of men who know that they are responsible for justice and public order; and those who have political authority or economic power are responsible for its exercise to God, and to the men whose well-being depends on it. This definition remains valid. We must introduce it into new contexts, however. For it arose within the sphere of Western democracies and hence is handicapped by a certain particularism because of which a convincing connection with the eschatological universalism of the Ecumenical Movement was not achieved. We want to clarify the relation of the Amsterdam concept to universalism. Therefore we can no longer hold that a universal moral law and corresponding divine plans for the world can be known by men. Instead, we connect the concept of "responsible society" with that of the world "come of age", and will now relate it to the theological concept of peace which thus wins a central position in theology and ethics.

IV. The peace of God and peace in a coming world community

1. The theological concept of peace

The consolation and the prayer concerning peace is an essential part of the worship service of the Church since earliest times. When the apostle Paul salutes the Roman congregation with peace from God (Romans 1,7), a gift is communicated which is real in this world; because it is a reality, it is necessary to hunt after peace and make peace among men here and now. All the variationsof the Biblical message speak of peace. This must be so for a theological reason: "God is not a God "of confusion, but of peace" (I Cor. 14, 33). Though the theological concept of peace is extremely wide, we should guard against using it in a sweeping emotional manner. Therefore we shall outline its distinct structures.

When the Old Testament speaks of peace, it does not speak merely of a spiritual good. Peace is the gift and the destiny which God gives to creation. It is not an addition to the creature's life and being which could just be left apart. Where peace is missing, or disturbed, the creature is injured and jeopardized in its very being. Peace is a real good; it has its place where man, living creature and thing exist together. In order to be right, all that is created needs and strives for partaking in this good. Man by his fall disturbs and destroys peace and robs the creatures of their part of it. By himself, man cannot regain all-embracing peace. God however, makes peace by reaching beyond man's inability and opposition. Hence, Israel hopes for peace as for a good of salvation which includes all: the people's quiet life in the land of promise, unthreatened by enemies, reconciled with animals and things; the prophets even expect a peace like in paradise.

The Old Testament impresses on us especially the social and environmental reality of peace. The New Testament teaches with eschatological hope the distance of man from that peace. Man intent upon himself lives in opposition against God and accomplishes corruption instead of real peace. Christ frees from this constraint. Thus, "He is our peace" (Eph. 2,14). As far as we participate in Christ, we hope for that peace which we ourselves cannot accomplish, God's peace to come. If we realize, both, what we accomplish and what we hope for, we are guarded against the dangerous illusion that one could make total peace in the world by force without disseminating corruption. Total peace, or salvation, can only be expected as God's eschatological gift.

Corresponding to this eschatological hope, however, an actual endeavour arises in the present. Already here on earth we are promised God's salvation and told to be children of God; thereby we let ourselves be moved to strive for peace. The great sign of the transformation which siezes us from God (Matt. 5, 44 f) is love for the enemy which does not acknowledge the existence of an inimicalness even over against the most irreconcilable enemy. Certainly, love for the enemy does not mean paradisial peace on earth. The "enemy" is free not to accept this love, and we can never regard it as a sure property of our own. Nevertheless it is an actual step toward real peace, since it does not obey the dictates of enmity. Jesus did not

let himself be determined by the inimical will of those who made him suffer and die, and he encourages us to follow his way of activity.

Peace begins where enmity, the will to destroy each other, is annulled by love. Love gives room for life to the other, even to the unrighteous one. It gives peace amidst strife which it clearly perceives. By giving peace, it proves itself responsible for God's creation because it gives it the peace which it needs for its being. Faith makes us love, and love gives peace. What is done on these grounds, then, converges with all activities towards relative peace in the world which use reasonable means and answer the creatures' need for peace. Love takes upon itself the responsibility for the preservation of God's creatures that exist now. Love changes the world, but it does not pretend to bring it to perfection. It rather respects the world in its provisionality.

2. Peace of faith and peace of civilization

Peace as final salvation expected from God acts upon the Christian's attitude even now. Its present influences, however, should not be misunderstood as aiming at a supposedly eternal worldly peace. We can say, with a phrase of C. F. von Weizsäcker: "World peace is not the Golden Age." It is rather certain that there will still be conflicts in a peace which we can attain. What is requisite for a world civilization is peace in the form of a world-wide regulation system to channel conflicts so that their dynamics do not get out of human control. Antoganisms and tensions ranging from the virulent conflicts of hard competition to fair play, as sometimes occurs in intellectual and athletic competition, will probably remain. It would be illusionary to aim at abolishing conflicts as such. When Karl Marx aimed at a total abolition of "alienation", the claim to absoluteness caused the class-conflicts existing in his time to be regarded as absolute as well, and thus it was overlooked, that, as social conditions are transformed, class-conflicts disappear, ease up, or shift. The utopian intention of arriving at social conditions in which all conflicts are perfectly abolished soon leads into totalitarianism and ideological fixedness. He who impatiently intends to realize eternal peace under earthly conditions runs the risk of adding to discord instead of to real peace.

Utopian impatience can be dangerous, but the attitude of taking things as they are as a sealed fate can likewise be dangerous. When the nations are in a situation of deterring each other by threat of annihilation, a thorough change of the manner in which men and societies live together is necessary. In order to make that temporary and finite peace possible which is prerequisite for a world civilization, the consciousness of what reaches beyond all divergences and conflicts must grow. We must find an order which all who are concerned can respect as something they have in common, as for instance in a democratic order the constitution is respected even by the opposition parties. The peoples' and societies' respect for what they all need for life must replace progressively the practice of mutual threat. Then the regulations without which a future world community cannot exist might be established also in terms of law.

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The transition from mutual deterrence to the recognition of the common basis of life demands from men, in whatever people or nation, an "extraordinary moral exertion". Weighty obstacles hinder the way: continued mutual distrust, ideological divergence, national egotism, habitual mutual discrimination of races and groups, and many other particularisms which have seized the heart of men in our world. But the rational insight is spreading that peace, be it ever so finite and temporary, is prerequisite for life in the technical age. There are men all over the world who are ready for an "extraordinary moral exertion" in order to reach that peace.

In earlier decades and centuries, the unity of mankind looked like an ideal which could never be reached in history. Continents and peoples lived in separate traditions. Contacts mostly resulted in controversial positions. Realities like these gave a tinge of unreality to the ideal of unity. Up to our times, Chinese, African, and European history could hardly be understood as a common history. Now, scientific-technical change proceeds along the same lines everywhere on earth. The truths of mathematics, physics, and chemistry are international. Industrial production calls for rationalization of its methods all over the world. In this way, certain similarities arise amidst remaining differences. Today it can be affirmed that some fragments of a unity of mankind really appear in the technical-scientific civilization. Together with the experience of an interdependency all over the world, there is an increasing awareness that a global civilization cannot exist without an order of peace on a world-wide scale. Science and technology effect both the unity of mankind and the necessity of peace. Over against or aside from Christian universalism, which understands mankind as a unity because of Christ's redeeming and proclaims God's peace to all the world, there arises today a civilizing universalism which is conscious of the necessity of a peace bridging the conflicts. Shall we take this situation of the world as a gift from God, or will the unifying powers of the civilizing process end up with an inhuman world-wide dictatorship?

3. The ethics of science in a coming world community

Our point of view, in terms of which some aspects of science and technology will be scrutinized more closely in Paper B, is this: the "irrational dynamics of the civilization of the industrial age" (C. F. von Weizsäcker) are to a large extent due to irrational dynamics of science. Today, the process of civilization as a whole seems uncontrolled by reason. If these dynamics remain uncontrolled, they are explosively dangerous for life and peace in a coming world community. The manner in which the sciences have been working has contributed to this danger.

For those who work in the fields of science, the irrationality of the dynamics of science as a whole is obvious. A special science may work with great success andyet without any methodical exchange of experiences or results with other sciences. Each science speaks a language of its own. Contacts are made mostly by chance or formsome practical purpose. It is not only that natural sciences and cultural sciences cannot cooperate with each other, but this cooperation is lacking among the natural or cultural sciences themselves. This obviously is unreasonable and irrational.

Scientifically gained results, especially in the fields of natural sciences and technology, are widely treated like merchandise which as soon as it is on the market is no longer under the control of the producer. Published results of a scientist's research work can be used in a way which contradicts the "spirit of science" and the ethos of the scientist, and he can do nothing about it. Political and economical powers and experts of all sorts buy the results of science and use them at will, often without being able to preconsider the consequences. This is indeed alarming when science is discovering means to manipulate the biological and psychical structure of man.

We can put the problem thus: the process of scientific work as a whole and the use of its results is still inaccessible to the postulate "responsable society". To bring science and "responsible society" together is, first, a practical task. The coordination of sciences and the control of the use of results must be organized. It is, second, a political task. There ought to be public discussion and regulation by authorities who are equal to the task. It is, finally, a scientific problem since it concerns the manner in which science understands itself, the idea of science and the ethos of the scientific forming of the world.

From its Greek origins, science has the tendency, which it often follows unconsciously today, of understanding itself as "pure", i.e. as gaining theoretical knowledge of what is. According to this understanding, the consideration of the future world-changing outcome of scientific thinking is no scientific task. A science which concentrates on what invariably is at all times excludes the future as not really belonging to its field. It claims to have nothing to do with the future changes of the world, even if its results effect them.

Consideration of a science's effects on the future inevitable involves both theoretical and ethical reflection. Here lies the "responsibility of science". We need sciences today which methodically and consequently include in their field the changes which their own results are likely to bring about. This makes scientific methods for the cooperation of sciences necessary. Science as a whole cannot stop provoking irrational uncontrolled dynamics in our civilization as long as science does not realize that it is also responsible for these world-changing effects. Without taking responsibility for its own activity, science can hardly partake in the moral exertion of winning world peace. In the situation of the world today, it is vital to consider the future changes which our present activities might bring about. This necessity joins scientific thinking to Christian ethics, in an ethics of hope. They are both looking out for man's true future.

V. Ecumenical theology in view of a coming world community

The Church of Jesus Christ is not defined by the functions which it has or should have in the existing systems of society or in the system of a future world community. Christian ethics and the Christian's practice are not the fundament of the Church but an expression of the life which it has by virtue of its Lord's relation to it. Such an expression is however necessary. The Spirit, which is alive in Christ's congregation, presses for a concretization of love and hope.

The outlines of an Ecumenical theology for our times have been drawn by two great world conferences of the churches. Amsterdam made the ethics of love concrete in the concept of "responsible society". Evanston articulated the Christian eschatology in the confession: "Christ - the hope of the world". The Geneva Conference aims at clarifying the spiritual and social basis for life in a coming world community. There the statements of Amsterdam and Evanston must be integrated into this new context. Determinitive for the Geneva Conference is the insight that science and technology are effecting a certain unity of civilization. At the same time they endanger ever more seriously, the life of a large section of mankind. World peace is a vital necessity in our situation. How can Ecumenical theology contribute to its realization?

Theology knows that the relative peace of a coming world community is a purpose for which any man, religious or non-religious, agnostic or humanistic, Marxist or Christian, can and should strain every nerve. Everybody must be reminded of this responsibility, and Christians must be ready to cooperate with everybody for this purpose. Peace is not merely a welcome addition to life; it becomes an indispensable good for survival. Thus it is an urgent task for everybody to develop new moral attitudes which direct the dynamics of civilization towards peace. This new dynamics which changes the world must itself be changed so that it does not destroy but preserves the life of mankind.

Is there here a specific task for Christianity? Those who hear Christians speak of such matters will first look at the attitude taken by and in the churches. How do Christians live in Ecumenical relationship? Can a non-Christian observer see from them attitudes which might lead to peace in a coming world community? Or will he see the inhibition of community and the impossibility of understanding even among Christians? This is a pressing question for every Christian who dares to speak of a specific task for Christianity. Its most specific task is undoubtedly to be the true Church of Jesus Christ and to witness in the right spirit to the salvation from God expected by faith.

The hope for God's salvation is not merely otherworldly. As a living hope, we are compelled to express that Christ as the Son of God is the light of the world. The World conference of New Delhi in 1961 had this confession as its centre. Josef A.Sittler expounded it by referring to Colossians 1, 15-20. God's almightiness and the Lordship of Christ concern all things, also earthly nature as a whole. According to Sittler, we should work towards a dauntless, penetrating, affirmative Christology of nature, a cosmic Christology, to confess the "cosmic Christ". This interpretation has met with some valid criticism and much approval. There are parallel interpretations also in modern Roman Catholicism, especially in France.

The Church must indeed confess God's Lordship in Christ as a rule concerning the whole cosmos. It is not enough, however, to confess the "cosmic Christ" in a speculative view of the cosmos. We must learn to understand and testify to what our faith in Christ has to do with that real world which we investigate in science and manipulate by technical means. Wherever we get in touch with the world as a natural as well as a cultural creation, a concrete expression of our confession of Christ's Lordship should become evident. We are certainly not able to express fully and adequately what it means to confess Christ. However, if we cannot express our faith concretely anywhere in man's scientific and technical dealing with nature, the non-Christian will perhaps listen to our confessions with respect and wonder, but not grasp what they have to do with the world in which he lives.

Within the context of scientific-technical activity as it is carried on today, a reference to God or the "cosmic Christ" seems meaningless. It would make no difference to modern man's view of such activity if there would be no God, etsi deus non daretur. God has no evident function today wherever in nature and society modern man must be active on his own. In view of this, we confess with Bonhoeffer that man who is come of age is claimed by Jesus Christ. Christ rules the world in the situation in which it is today by summoning men to follow Him who are active in the world on their own responsability because God reveals Himself as little to the followers of Christ in the context of scientific-technical activity as to secular men. Christians who consciously accept their responsability in this situation show that they are "of age". Their faith in Him who is the Lord of the world even where no evidence is found leads them to understand that they are in this situation not because of an evil fate but by God's will. They show their faith when they recognize that God wills man to come of age where this world, nature and society, is concerned.

The dominion over the earth to which man is called according to Genesis 1.26 reaches extremely far today. No everlasting natural law, no eternal purpose is evident to us on earth. Modern man does not see in the world a mirror for God. As the object of science and technology, the cosmos no longer calls for religion. Man's forming of this world makes the necessity for religion disappear. But if he can become godless, he can also accept the situation in which he must exist as from God, directing him to Christ and His way of being Lord in the world. He can take the irreligious technical-scientific world as a reason not for godlessness but for faithful participation in Christ's suffering and obedient attention to the Redeemer's mission. Christ thus comes to be his Lord. The man come of age who recognizes Christ as his Lord will believe that God in Christ rules the cosmos which today includes the technical-scientific world. He will not however presume to point out where God comes into the world civilization of our times. The hope for salvation and the responsability for civilization will not be mixed up by him.

As Christians we must confess today that we know as little as other men of the ways in which God will lead the world into its oncoming future. We have no certainty whether our activity complies with God's plans for this changing world or not. That we do not know does not cause us to give up all activity but rather sharpens our attention in two respects. First, we must consider more attentively how love might become concrete in the tasks which we see immediately put before us.

Second, we must pay closer attention to existing injury and perils which threaten peace of the world; in view of these, however, we must look out for remedies which we in faith may take from God, and we must use the possibilities which we are given for making peace, believing that God can move human reason to be at His service and accept as a service also what science does.

The service of God does not look the same at all times and in every situation. In the present situation of the world, service that might take the form as human management of the earth as a whole. It is rather likely that the balance of mutual deterrence will not bring about a lasting stability; the status quo can hardly be accepted by God as valid since it does not serve a true humanization but stabilizes an inimical particularism which tends to become inhuman. Service in this situation could happen as bridging over the conflicts and winning a wider order of peace.

The ethics of love makes it urgent to overcome enmity for man's sake. It is an old experience, however, that an illusionary utopian impatience will aggravate dissensions instead of overcoming them. Intent on expressing himself in his activity, man introduces into the fields in which he is active what is wrong with himself. God frees man from such destructive egotism by revealing to him in Christ His unconditioned love. He who believes in God's unconditioned love is free to see what there is to be done by him, and to do it. With this freedom to be objective God gives patience which is not resignation but concentration. It may be hard for man to realize that force finally will be overcome not by counter-force, and violence not by counter-violence, but by a powerlessness which stems from love. The stronger Christianity's belief in the promises of its Lord, the greater the freedom for the patient conquering powerlessness of love. To contribute to this freedom is a specific task for Christianity. It is not a tangible contribution, but a real one nevertheless. He who lives in this freedom knows of the real peace which cannot be won by force.

Christian ethics is rooted in love and in hope. Expectancy of what is to come frees us from clinging to what is. Hope is ready for new possibilities even where nothing can as yet be seen. The Christian eschatological hope cannot be directly translated into a specific world-changing dynamic activity. The "old man" who is intent on himself can also creep into Christian activity. With the eschatological hope, however, a new spirit is given to the Christians, which includes freedom to discern what in the present world does not accord with God's will, and which things God still intends for living mankind, each in its own specific time. In this spirit the Christian can be on the lookout for the relative peace which is prerequisite to life in a coming world community.

Love and hope are not mere moods. They become concrete in man's attitude in a given situation. To make them concrete, no "idealogy" is needed but sober clear-sightedness and productive imagination. Ecumenical social theology should show this amidst the idealogically separated and hostile systems of society in our present world. Its task can hardly be to add another idealogy to the contending ones.

Since we are of the opinion that Christians should not allow themselves to be misunderstood as having a specific ideology, we must also warn against proclaiming a universal moral law as accepted by Christianity. Yet man can and should strive for what the natural law tried to determine, namely : a justice free from human arbitrariness. Without a righteous law there will not be a bearable lasting peace. The traditional natural law could still assume that righteousness and law were given as a "natural" order. Marxist ideology postulates that they will be given after the abolition of all "alientation". Rather we should work them out specifically in view of that peace which a world community needs for life, knowing that conflicts cannot be disregarded. And this different context also changes the understanding of justice.

Considering science and technology as world-changing powers with ambiguous effects on man's future, we made peace the centre of our attempt at an Oecumenical social ethics : participation in God's peace and responsability for the temporary peace of a coming world community. The connection of this centre with the concrete problems of science and technology is, to be sure, much more a programmatic summons than an achievement of cooperative scientific reflection. (A later paper will show how such thinking in common has been tried up to now).

ASPECTS OF SCIENCE AND TECHNOLOGY IN A COMING WORLD COMMUNITY

Exemplary material for Pap r A.

I. Introduction

1. The influence of science and technology on the arising world community.

Today, all societies have begun to live in a common history. The World Conference on Church and Society in Geneva 1966 searches for the spiritual and social basis on which a coming world community can be built. An enquiry into aspects of science and technology might be helpful to achieve this goal.

The historian can attempt to surmount the narrow barriers in which European historiography has been confined, in order to open views to world-wide history. The international law scholar can design new schemes for settling future conflicts. The philosopher and sociologist, by constructive criticism can try to overcome the gulf between the two social systems which dominate the northern hemisphere. The theologian of mission can examine the possibilities of coexistence and cooperation of the different world religions in the coming world community.

All the tasks named have in common the need for scientific contributions. Science apparently has to contribute something to the coming world community. We seek to specify this in the following pages. By saying "science", we imply technology, in view of the fact that technology is becoming more scientific as well as science more technical.

How do science and technology influence the arising world community ? The common history in which we presently live is mainly brou ht about by scientific and technical achievements, for instance through communication, and information, which reach out all over the world. Science and technology have changed the surface of the earth. Their power to engender change will even have to grow rapidly in the future. The increasing population of the earth, possibly five to six thousand million in the year 2000 instead of three in the year 1960, will have to be fed. Modern hygiene by encouraging this growth of population has also encouraged revolutionary crises. Modern physics is producing ever greater possibilities for human wellbeing as well as potential catastrophe by manipulating atomic energy. The possibilities and dangers which biochemics will raise up can at present merely be vaguely estimated.

Ours is a paradoxical situation. The dangers produced by science can be met only by science. Science and technology have revealed themselves as an earth-moving power which is changing and will increasingly change man and his world. Their changing power shows itself to be stronger than all pol tical revolutions known in past history. For humanity

science raises the question on whether or not it intends to survive the oncoming decades or centuries. Thus, our present time appears to be a time of crisis, of transition. The traditional constitutions of national states no longer guarantee sufficient protection of their citizens. In a world of growing interdependence of all societies and continents, conflicts cannot sufficiently be governed only by means of national politics. Weapons are so effective today that wherever a military conflict arises, those rights and values which the states mean to protect by military means are endangered by them on both sides. We shall have to find our way through this danger zone and arrive at an order of peace for a coming world community. Today, we recognize that this order of peace is necessary, but we cannot yet realize it. Peace no longer is a political problem in the narrow sense, because science is also responsible for it.

2. First steps towards a new reflectiveness of science.

The revolutionary changes of human life on this earth were caused by science which understood its task as a "pure" acquisition of knowledge. "Pure" science delegated the responsibility for its results to the politician, the industrialist, or the soldier who made practical use of them. Can this ideal of "purity" still be regarded as valid ?

In face of the radical changes science has brought about in the world, in view especially of the military use of atomic energy, scientists have asked themselves whether a science which refuses to take into account its own practical effects is scientific any longer. Doubtlessly, it is no longer effective with regard to the dangers it causes. In order to regain control of the processes caused by science, a new consciousness of science is required.

A first example of a new consciousness of responsibility is exemplified in a group of physiciats, Niels Bohr, James Franck and others, who since 1944/45 have tried to make clear to politicians in England and especially in the USA what the effects of dropping atom bombs would be. Other groups of scientists followed the initiative they had taken. Soon after the atomic bombs had been used in Hirochima and Nagasaki, the Federation of Atomic Scientists, later called Federation of American Scientists, was founded. Like these Americans, Russian physicists recognized that developing atomic weapons meant taking upon oneself a definite responsibility. In 1946, Kapitza and other Russian physicists resisted Stalin's directives which demanded their cooperation for the development of an atomic bomb. Later, the Pugwash conferences were started which bring physicists and other scientists from East and West together to discuss their common problems.

Ecumenical theology should carefully study this consciousness of responsibility for its own effects which science has begun to develop. Our thesis is that new contacts between theology and other secular sciences become necessary at this point.

There are many who sympathize with science's attitude of responsibility; there are few who are prepared to realize it. Practical attempts to act responsibly often necessitate decisions whose political and social effects the scientist is not trained to judge. Even theoretically, the responsibility of science has scarcely been considered. A cooperation of physics with philosophical and theological ethics has seemed unthinkable.

In view of the need to articulate the new reflectiveness of a natural science, the categories of "individual" ethics prove rather unsuitable. If an action is judged exclusively by the decisions taking place within the conscience of an individual, any effects produced without this individual seem inconsequential. Theological ethics which really wants to help today must overcome the confines of an exclusive moralism or spiritualism and seriously enter into a two-way cooperation with the secular sciences which need the help of Christians in the world.

Goals for the development of helpful Oecumenical ethics in our situation have been formulated for instance by Dr. Visser t'Hooft ten years ago, when he summoned us to move on from the consideration of "responsible society" to the consideration of "responsible science". The special problems of atomic warfare have compelled the Executive Committee of Churches for International Affairs at Nyborg in August 1953 to formulate the twofold task of interpreting the nature of the atomic age in theological terms, and inquiring into the tensions between the conditions for the survival of mankind and the traditional systems of justice and order.

One of the limitations which a relevant Ecumenical theology will have to overcome is the avoidance of theologically interpreting the world and time in which we live. Certainly, we have experienced the horrid effects of theological misinterpretations of history. But this should no longer hinder us, as Hendrik Berhof has stressed, to recognize our task of interpretation and try our best. To interpret our present situation is, however, a task which cannot be handled otherwise than cooperatively. Christian theology cannot claim such an enterprise exclusively for itself. It is a task especially for those branches of science which have produced the present situation. Yet theology must contribute through contacts with these sciences.

The following considerations have grown out of a tentative contact between one branch of science and theology. We shall refer mostly to physics and to big-scale technical-scientific research effected by discoveries of physics. This is only one aspect of the present situation; we cannot claim that it is the only important one. It is, however, an aspect on which many others depend. And, finally, any pertinent step taken to interpret our situation will make visible new points of reference for responsible actions.

II. Big Science.

Science has come to be one of the Great Powers ruling the present world. No society, no country on earth can evade that rule. Steps taken within science will also determine the destiny of civilization. Within the development of science new ethical problems have appeared. We wish to consider them now in a few examples. The first example we select is big science. We cannot treat in full automation and cybernetics. The information accessible to the authors of these papers was mostly American and Western European. There was no sufficient information from the USSR; it can be supposed, however, that analogous developments are taking place there.

We cannot avoid speaking at length about military developments. Regrettably we are handicapped by one-sided "Western" information. The experience of how quickly one gets into the military realm when dealing with recent scientific developments certainly causes uneasiness. It is none the less necessary to reveal this fact which is all to often suppressed into unconsciousness. Even the development of big science goes back primarily to military impulses. What big science will mean for the civil realm can hardly be seen as yet. The new weapons which are ready for action at every moment mean much more for the realm of diplomacy than armament did in times past (Raymond Aron). Weapons nowadays can be used by diplomacy as a language in which nations can communicate more unmistakably than by means of political notes and contracts. Not only diplomacy but also theology will have to learn to understand the harsh language of modern weapons. Any endeavour to bring about peace will have to take into account their political reality. Christianity should firmly resist, however, endorsing a notion still found in East and West, that war with modern weapons was a rational, reasonable means of politics.

Two experiences belong to the most startling signs of our time First, the rapid shift of scientific results from writing desk or laboratory into industrial, political and military disposal. Second, the direct military interest in scientific research for new methods of annihilation.

1. Origin of big science and its current types.

Big science means institutes of 300 or even 1000 academically trained people working together. Brains with which one or several large universities could be run are concentrated on a single task, or on groups of related tasks. Solutions must be worked out as fast as possible.

We may regard the erection of the American atomic research cities, 1942 to 1945 as the origin of big science. Around the turn of the year 1938 to 1939, the Germans Hahn and Strassmann conducted the laboratory experiments which led to the fission of uranium. Within less than seven years the atomic cities Los Alamos and Oak Ridge had translated the discovery into industrial production. The scope to be covered by that translation can be exemplified by the artificial element Plutonium. In the laboratory, fractions of milligrammes had been produced and studied.

Big science enabled the industry to produce kilogrammes of the new element - 10,000,000 times as much, or even some ten times more than that. This figure makes clear that "big science" is not what formerly was called "applied science". The exemplified translation and other requirements made new basic research necessary. Thus the atomic cities have been the first to realize the unity of basic research, applied science and technology.

There was no inevitable necessity to produce atomic weapons at that time. A couple of scientists had by free will decided to develop the atom bomb. They dreaded that Hitler would drop atom bombs, and hastened to the relief of democracy in an hour of utmost affliction. Their decision from which big science arose introduced physics into strategy. As a consequence, traditional strategy burst asunder.

This crisis of politics which had been provoked by a natural science reached its peak when the H-bomb was tested in 1952/54. Up to that time the danger of Hiroshima-type bombs being used in a war could be calculated as not annihilating nations as a whole. After the new test, it became apparent that whole nations and even continents would not survive an H-bomb war. The weapons produced to help an order of freedom survive begin to question the physical survival of mankind.

Institutes of big-science-dimensions will be organized and financed only when public needs are pressing. The "atom cities" illustrate that. There is a pressing need for peace now, but it has not yet released similar energies. The original institutes of big science as well as the other prototypes of big science today sprang from national military decisions.

The organization and financing of big science brings about new forms of cooperation for science, industry and politics (including military strategy together with "strategy of disarmament"). The European institutes for instance cannot be financed by single nations. The institutes tie the nations together. This influences the structure of the individual states whose political activities are now partly bound to long-lasting international conventions.

Doubtless, structures similar to those of big science in the USA also occur in the USSR. The American information presents three types of big science today. The first aims at material results like new constructions of nuclear reactors; the atom cities also belong here. The second type aims at new organizations of systems including both man and machine. The third type, the so-called thinking groups, aims at the production of ideas only; this type can be reckoned among systems research in a large sense.

The development of 25,000 MW-reactors to transform ocean water into sweet water to irrigate deserts is one example for the first type of big science today. The output of four reactors of this type would be equivalent to the electricity used by an industrial country like Western Germany. Reactors of this efficiency will have to be built when the food problems of a rapidly increasing world population demand solution. Smaller sweet water plants and their political effects can already be studied in Israel. Another example for this type is the "plowshare"-project (Isa.2.4). Guided atomic explosions are to carve channels, harbours etc. into the surface of the earth. The project "fast breeder" will have developed at the end of the 1970's a reactor which enables us to put uranium resources to economical use.

An example of particular importance is weather forecast. Edward Teller, constructor of the H-bomb, estimates that weather forecasting will be perfect in ten years, and weather manipulation in twenty. Teller is convinced that this will necessitate new forms of political coexistence on our planet. Without a "world weather management", maybe even a world government, weather problems then could no longer be solved peacefully.

The prototype of the second type of big science is the MITRE-corporation. It was built up in 1958 from the Lincoln laboratory founded by the Massachusetts Institute of Technology in 1951. The task of the laboratory had been to organize the air defense of the North American continent as a system including both man and machine. This kind of defense organization had been attempted as early as 1935 in England by Sir Henry Tizard and others, and had stood the test in 1940 in the "battle of Britain". MITRE consists at present of 700 academically trained persons. It has organized for the American forces all over the world the systems of information and command which provide for permanent survey. It has also organized a system of crisis management by which both allies and opponents can be influenced. It is developing more complicated systems which would even work in later stages of thermonuclear war in order not to miss any chance of making peace.

The third type of big science occurs for instance in parts of the RAND-corporation (founded in 1946): thinking groups which neither construct reactors nor organize man-plus-machine-systems but produce ideas on the basis of "operations research" with the aim of large scale systems engineering. Tasks here are to analyse future military constellations as well as disarmament schemes for the long run, but also to find the optimum coordination of man and man-plus-machine-systems in the realms of industry and society. How to steer the development of future machines so as to suit man best, and likewise to teach man to keep machines under control is one of the general problems of responsible planning today. Here big science verges on large-scale culture politics. Systematical use of big science will increase industrial productivity considerably. The social and political consequences of this increase will have to be analyzed in time by systems research. Thus, this third type deals with planning on the highest level. The possibilities of this type of big science to manipulate man's future are great. So are the dangers. Both deserve careful consideration. It is self-evident that the three types which we separated inter-penetrate each other in reality and will more and more do so in the future.

2. Big science and the responsibility of science.

In the institutes of big science, man's desire to mould and change the world becomes obvious. This no longer fits into the traditional concept of "pure" science. A science which needs a cyclotron cannot work without technology. The institutes of big science, especially in the USA, have become nerve centres of whole branches of industries. These industries earn up to 35 % of their income by research work, which makes them more and more resemble scientific institutes. Big science reveals that science tends to become technical and technology tends to become scientific. Here we clearly see that science can no longer deny any responsibility for effects which might occur outside of its theoretical realm.

The concepts of "pure" science and instrumental technics no longer suffices. If practical effects are inconsiderately left to themselves, the process of science and technology will overcome man who set it in motion. Man constructs machines, but they will give back to man what he has done. The conditions of his life, the contents and structures of his thinking, he himself, the whole way of being man on earth will be affected by his doings. If man simply leaves the process to its own dynamics, he declares himself an irresponsible being.

In the past centures, science set in motion a dynamic process of civilization. Among the changes which it brought about are many which no one would like to miss, and without which many could not even live. Science has revealed its power both to support and endanger even the physical existence of mankind. Big science is one of the symptoms which show that a new consciousness of science must be reached. We need a more effective science. The dangers which science will bring up while becoming more powerful can only be met when science also learns to consider its own responsibilities by scientific methods.

III. Changing Consciousness in physics

In the preceding section we chose big science to exemplify the general change of science and technology and the ethical problem arising with it. We now choose the change of consciousness in physics to exemplify the beginning of a new understanding of science in general. Physics has long been reputed to be the science which is most representative for modern occidental scientific developments. A change within physics therefore may mean something not only for natural sciences but for science in general.

In 1944 or 1945 when the USA was ahead of other nations in the control of nuclear energy, physicists like Niels Bohr and James Franck tried to convince influential politicians that this was an opportunity which should be seized to set out a new course in international politics. What made these physicists leave the premises of their special science and mingle with politics? The politicians did not understand. The consequences of their misunderstanding were sad enough, especially for Hiroshima and Nagasaki. Nevertheless it is quite understandable that they did not understand. There was little chance that the politicians knew anything at all about the crisis in the foundations of physics which had stirred the conscience of these scientists. The crisis had developed rather dramatically from about 1900 to its peak in the years 1924 to 1927. Revered philosophical positions had to be given up, presuppositions of classical physics which had been accepted as unquestionable were now questioned. The politicians to whom the physicists came at the end of the Second World War did not share their background and consequently could not share their views. They were not able to see that the new results of physics, the control of nuclear energy, would render new political forms for the coexistence of nations necessary.

Anybody who endeavours to make real peace may be interested in how physicists came, for example, to suggest to politicians, inviting Japanese and Russion delegates to an atom bomb demonstration instead of dropping the bomb on the enemy. We shall try to sketch, however imperfectly, the way which led to this initiative. Before, however, a warning. The "Copenhagen interpretation of the quantum theory" which we consider the philosophically most important interpretation of the discoveries made by modern physics is not uncontroversial. This interpretation was presented chiefly by Niels Bohr and by Werner Heisenberg who studied with Bohr. Wide attention was paid to it, but leading physicists objected to it, and philosophical schools opposed it intensely, especially the school of dialectic materialism; but also Günther Jakoby and several philosophers of the Nicolai Hartmann school, and the schools of Roman-Catholic natural philosophy. Recently, critical objections to Niels Bohr have mainly come from Karl R. Popper and some of his friends.

The Copenhagen interpretation of quantum theory has brought physics and theology into renewed contact. Even in our century many theologians assumed that the gulf separating theology from physics was to be everlasting. Theology resigned and withdrew into the spiritual world, into "existentialism", abandoning the physical world to the natural sciences and technology whose boundless autonomy was taken for granted. Theology no longer spoke about man's earthly nature and his relationship to the world around him. The Copenhagen interpretation has critically relativized the inflexible determinism of the mechanistic concept of the world backed by classical physics. Thus it has removed some of the previous obstacles to a dialogue between theology and physics.

1. The Copenhagen interpretation of the quantum theory

Let us listen to Niels Bohr speaking over the radio to Danish high-school students on April 1st, 1949. He is presenting to his listeners the principle of "complementarity" by which he himself had interpreted the quantum theory.

"Some of you may have heard already about the surprising difficulties which arise when we ask: what is the nature of the electron? On the one hand we cannot but regard the electron as a particle, since we always get the same results when we measure the mass and the electric charge of an electron. On the other hand, if we want to describe other attributes of electrons, we cannot do so without a picture of waves similar to that which has proved indispensable when describing the transmission of light ... Such a situation, hitherto completely unknown in physics, simply caused utter confusion in the beginning. However, as time went by, it was seen that the pictures which contradict each other are never used to describe one and the same phenomenon, but only to give account of experiences obtained under different, mutually exclusive experimental conditions. Such experiences thus are related to each other in a way which is called complementary in order to underline that, in spite of the fact that they cannot be united in a single evident picture, either one expresses equally important aspects of the total amount of information which can be obtained".

If we grant to Niels Bohr that he is right in postulating the necessity of complementary observation, we can no longer maintain some earlier concepts of man's position over against nature. In classical physics, the observing subject's separateness from the observed object had been conceived as complete. In nuclear physics this can no longer be done. Heisenberg infers from this that: "Research no longer aims at knowledge of atoms and atomic movements per se, i.e. as apart from our intention to know by experiment. Rather we are right from the start involved in the argument between nature and man of which natural science is just a part. Thus the popular divisions of the world in subject and object, spiritual and physical sphere, body and soul do not fit so well any more, but lead to difficulties".

Among the physicists it was Albert Einstein who fought most determinedly the concept of a dependency of the so-called physical reality on the experiment selected and arranged by the physicist. C.F. von Weizsäcker sums up Einstein's conviction as follows: "In his understanding, the perception of reality with which the quantum physicists content themselves is Berkley's esse est percipi all over again. He hopes for a future in which physics will restitute the concept of physical reality per se". Einstein is right in opposing any attempt to eliminate the concept of reality from physics. He is tragically mistaken, however, according to Weizsäcker, in supposing that this is done in quantum mechanics. In fact, quantum theory conceives of the atom as not dependent on the contemporaneousness of two perceptions which are possible each at a distinct moment. Here the concept of a certain reality includes the course of time.

Bohr and Heisenberg had made their basic discoveries in the years between 1924 and 1927. About 1932 J. von Neumann suggested the need to consider whether the logic used in quantum theory differs from classical logic. The problem has since been discussed. Today it is especially C.F. von Weizsäcker who works at a logic of

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statements which include the temporal dimension. It is evident what the analysis of those structures of thinking which include the course of time means, when science is urged to take future effects into consideration in order to assume its responsibility.

These are hints which help us to understand how a man like Niels Bohr as a scientist made up his mind while the atom bomb was developed to consider what political and ethical consequences its existence would call for, and to suggest a consequent action. Niels Bohr's attitude towards reality may be characterized thus. Being, knowing and acting are no longer taken as three strictly separated strata; the separation into logic, physics and ethics, which was basic for occidental science since Greek times - Aristotle and the Middle Academy - is no longer obligatory. Scientific reflection must take place also in between physics and ethics. Attempts in such intermediate thinking have led to the construction of the atom bomb as well as to the initiative to prevent its being used. But there is scarcely any training as yet toward crossing the former lines of separation in a scientific way and arriving at scientifically relevant statements. Our helplessness when confronted with problems of atomic armament demonstrates how helpful such a training might be.

Problems such as those resulting from the ability of man to start nuclear war weigh on us today. We cannot postpone them until we have arrived at a new integrity of the former logic, with physics and ethics combined. On the other hand, we cannot solve them by simply reacting emotionally to the necessities of the day. Such reactions usually do not lead far enough. We have both to reflect and to act. Any progress in reflection, for instance in a single science like physics opens new possibilities for action, and actions bring up experiences for renewed reflection.

2. Dialogue between physics and theology

In the 1920's mathematics and mathematical logic rang with discussion of the "crisis in the foundations". Essential parts of classical mathematics were shaken by the earthquake of the logical antinomies which Bertrand Russell had shown. The expression suggested itself as applicable to physics where, in the years from 1924 to 1927, a crisis had reached its peak. One may even speak of a threefold crisis in the foundations: in classical mathematics, in classical physics and in classical logic. The crisis in the foundations of logic and mathematics meant crisis also for Aristotelian ontology, and crisis in the foundations of physics meant crisis for Cartesian ontology as well. We may add that the crisis of Aristotelian ontology entangled Roman-Catholic theology, and the crisis of Cartesian ontology did the same for Protestant theology. This is of course a great simplification of a small portion of the crises in foundations which arose everywhere. Yet it is clear that theology could not get away without being affected. For since the apostles' days theology has used the structures of thinking which the contemporary sciences offered. Theology has had to accept the task of confronting the sciences in critical solidarity. The task of expressing both solidarity and criticism is certainly none the less important when science and technology have become world powers.

The solidarity of being in the same crisis encouraged the beginning of a new dialogue between theology and physics. The dogmatically fixed frontier separating physics from theology was overcome by the recognition that classical physics in its deterministic interpretation was valid only within certain limits. The experience of the crisis in foundations led many a physicist to review the history of his science. The solutions discovered within physics proved to be more dependent on

philosophy and theology than had long been assumed. There appeared to be much more to the problem of Galileo's condemnation than one was wont to think. It can be shown today that religious and philosophical barriers hindered the Greeks from developing their mathematics into physics and physical technology of the same high standards. According to Greek understanding, matter was not created by the demiourgos who gave the world its structure, as Plato tells us in the dialogue Timaios. Matter, which only subsequently is shaped into an order, will not obey mathematics with full exactitude. Mathematics then can only report probabilities, not reliabilities, on matter. When the Christian message met the world of Greek science it brought along a different understanding of creation. God created matter ex nihilo. This means that while matter was created by the Word of God, it received commandments which it was enabled to obey exactly. In so far as matter does obey exactly, it can be enlightened by logical and mathematical reason. Thus the credo concerning creation widened the realm of logic and mathematics to include concrete matter. This widening started modern natural sciences and technology. Man's outstanding dominion over nature could then arise. So, what Christians believe about creation contributed essentially to the fulfilment of the commandment of Genesis 1, "subdue the earth", in that sense in which modern man has understood it.

The new domination of man over nature appeared already in Medieval technology. It was much more successful than technology in Antiquity. As early as around the turn of the 12th to the 13th century this technical success incited new scientific reflections on the cognition of nature. Contrary to what one usually surmises, European technology developed earlier than European natural sciences.

Towards the end of the 13th and at the beginning of the 14th century Latin Averroism fought for determinism. To counter this, new stress had to be laid on God's freedom, which was done especially over against the Aristotelian concept of the world. Among others Dijksterhuis, a Dutch historian of physics, has shown that this breakthrough made room for modern physics.

The spirit of dominion over nature came to the full consciousness of itself in the philosophy of Descartes around 1650. In this philosophy everything that is - except the res cogitans - will be looked at as an object to be examined by physics and handled by technics. There also arises with Descartes the paradox which characterizes modern times, that, while nature is more and more conceived as object, the subject of man appears ever more distinct. When everything that is can be regarded as an object, man can regard himself as lord and owner of nature. This was of thinking spurred the rise of modern physics in the 17th century.

In Descartes' understanding, everything outside man as res cogitans is an object which may be dominated. A consequence thereof is bourgeois capitalism's understanding that everything that is can be regarded as stuff for buying and selling. The dominance over the world of objects as it manifests itself in factories and machines during the 18th and 19th century is an expression of Descartes' mechanistic concept of the world. It can be shown that this concept in a way became a substitute for God. It conferred attributes of God, like unity, permanence, eternity, omnipresence, omnipotence, and wholeness to nature, and it induced the belief in man's absolute competence to make nature an object completely at his disposal. This belief was contradicted by the Copenhagen interpretation of the quantum theory, and was placed into a rather doubtful light by the atom bomb. Thus physicists themselves have overthrown the God-substitute of modern times. A new dialogue between theology and physics could begin.

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There is a discussion going on at present on whether, and how far the structures of thinking developed in modern physics might be used in theological dogmatics and ethics. This proposition was offered by C.F. von Weizsäcker in 1938 and more precisely formulated by Niels Bohr later on: May the structure of thinking used in modern physics, complementarity, be more adequate for such antinomies as occurred in Medieval teaching about God, like the antinomy between righteousness and mercy in God, than the Aristotelian logic which looks for truth apart from the course of time. Dialectic materialism is not inclined to accept such new possibilities of thinking, and wide sections of Roman-Catholic natural philosophy are not inclined to accept them either. We are of the opinion that it would be worth while for Ecumenical theology to scrutinize how far the new thought patterns will reach, fully aware that they have come up in the course of history and will eventually go down again into oblivion. Other sciences will have to undergo the same scrutiny. Older models of thought structures, a good deal of which they had adopted from classical physics may have to give way in part to new ones, as has been the case in modern physics.

IV. Conditions of peace in the technical age

1. The changing of man

Hitherto the concept of peace presupposed an alternation of peace and war. Henceforth it will become inadequate to conceive of peace as the alternative of war. Peace will rather become the vital groundwork of a technical age in which weapons are stronger than civilization.

In earlier times world peace looked like an unattainable ideal. Nowadays it must be attained. This peace can be shaped differently, according to the different ways it can be achieved. An emergency dictatorship established on the "radioactive rubble of the third world war" (Khruschev) differs from a provisional organization prompted by dread of such a war. To establish an order of peace which is bearable, without annulling for instance human rights and democratic freedoms for which part of mankind had toiled for centuries will demand our utmost endeavours. One should expect, however, that where the issue is annihilation or survival of civilization, there is also a capacity of straining every nerve.

Working toward world peace can be described as transforming what has been foreign politics of the nations into domestic politics of the world (C.F. von Weizsäcker). This does not necessarily imply that, analogous to the nations as they are today, a single world nation will have to be constituted. It is necessary, however, to constitute an order which can be accepted all over the world for channelling, limiting, controlling the course of conflicts effectively. And in order to help countries undergoing rapid social change and to supply the increasing population of the earth with food, the domestic politics of a world order could be more effectual than foreign politics of nations still in competition. Those who compete will sometimes miss the hands of the most needy when distributing their auxiliary funds, and will use up human and financial power to deter each other which might have been used for the benefit of co-citizens of the world.

If we want to establish a world domestic political order without rash haste, man's social attitudes and therewith man's social understanding of himself have

to be changed. We do live amidst rapid social change. The social structures, the ways of life and occupation are changing rapidly in all countries. Whereas in Europe around 1800 nearly 80% of the population lived in small rural communities, today, in a fully industrialized society, perhaps 10% are enough to care for the food supply. Equally radical is the change in occupations which have to do with science. If we sum up all men engaged in science and scientific technology who have lived since Antiquity, 80% of the total number is still alive, our contemporaries. These are some symptoms of the radicalness of change going on in our decades.

Mankind in the technical age cannot help being changed. What is alarming is that many of those who are concerned - in the West even more than in the East - think little of steering, controlling, surveying the process going on within themselves. They change in a way not quite conscious, not quite responsible enough. The dynamics of the process of civilization are irrational even within man. It is true that for some time man has been changed intentionally and systematically by groups and societies which foresaw a different future for him. For example, in Russia illiteracy was overcome by Lunatscharski, and higher education was established as a preparation for the industrial age. As a result the USSR has astounded the world by its technical success. This planned change also produced effects that had not been intended. Stalinism in its original form for instance could no longer be maintained. Changed man called for a changed form of government within communism in Russia. However, the planned change of man in the USSR and similar efforts elsewhere were still determined by the interests of a particular society. But man will have to live in a universal mankind. Changing man for that necessary future means to overcome the confines of particular groups. Man has to develop an understanding of himself which corresponds to world domestic politics. Total competition between nations or societies, each of which understands itself as the finally valid point of reference tends to make planning an instrument of constraint to totalitarian conformity in part of the world. Reference to the world as a whole, recognition of a relative peace within it as provided by a world domestic politics can make reasonable competition and planning an instrument of freedom to come, freedom from that constraint which the process of civilization, initiated by man but irresponsibly released, exerts on man. Science will have to do research on how to plan to render life human.

On the one hand our considerations on the changing of man can appear as sober reasoning far from illusions. On the other hand they doubtlessly verge on Utopianism. Maybe such a Utopia is no longer impracticable today. We simply need it. What could we expect it to look like when realized?

In the age of European Enlightenment much was expected of autonomous reason, of the sapere aude. The expectancies were, in some respects, even surpassed by what was realized. Enlightened reason, however, cast shadows and evoked reactions. Overpowering unreasonable ideologies, "collective obscurities" (Georg Picht) shot up, most sharply expressed in totalitarian systems. They have made our century the century of mass deportations, concentration camps, systematic tortures and mass murders. We would be mistaken, should we expect that the development of technical-scientific reason by its own virtue must result in rational responsibility. The result could just as well be the opposite. Processes of collective dehumanization get more powerful as the technical means get more effective. If we do not want to be put under constraint again and again, science must work out expedients which are more helpful than are as yet those of psychotherapy and social

psychology. We need the help of a reason which, rid of any illusions about its own almightiness, clearly sees its own limits and does what it can to seize the partly unconscious dynamics of science and technology in a responsible way.

How can philosophy and theology be of help here? Certainly, one of the foremost tasks of philosophy is to lay open the common foundations of scientific thinking in all individual sciences and thereby prepare the ground for mutual understanding and cooperation in scientific terms. Likewise theology, accepting that the cooperation of the sciences is a presupposition of peace in the world, will have to provide for relevant contributions. Philosophy and theology cannot however see themselves on the giving side only. They must be open to development of new structures and processes in our world. As yet they have not paid enough attention to what had happened and have not included in their scientific frame of reference the world peace to come. Otherwise, the spirit of European philosophy and the God of theology could not so easily be misunderstood as a partisan of the Western world.

2. The controlling of weapons

There is no end yet to the philosophical discussion about the quantum theory, and that phenomenon which denotes our time as the atomic age. The second phase of the technical revolution which is marked by automation, cybernetics, and, even more, by big science is still in full swing. This makes it none the less urgent to study how big science, especially in its third type, the thinking groups, influences the realization of peace. We have to concentrate again on the military realm, not only because information is available, but also because the problems are most sharply posed here, and both advances and obstacles on the way of solving them are most obvious. Two concepts will serve as examples: "arms control" and "controlled response".

Arms control includes a check on armament, but it is more than that. It is, however, less than a way to abolish atomic weapons. For such an abolition, something like a generally accepted world police would be prerequisite. "Control" is understood today, in addition to its traditional juridical meaning of competence and superintendence, also in the sense cybernetics have given to it, namely as self-correcting feed-back. Thus "arms control" means an armament policy which aims at guaranteeing multilateral security, safety on all sides, even without a treaty. The most conspicuous example for "arms control" without a written contract is the so-called missile stalemate. We will sketch the model suggested by J.B. Wiesner in 1959/60. Its actual form today is somewhat more complicated.

If there are two great powers either of which is in possession of several hundred intercontinental bassistic missiles in "hardened" bases, i.e. where they cannot be destroyed, there will be no advantage in a surprise attack of the one on the other side, since the attacked, even if most of the country is destroyed, is still in command of a vigorous "posthumous" retaliation on the attacker. Neither is able to annihilate the other without himself being annihilated in consequence thereof. This gives to both a certain security. Wiesner had proposed the utilization of the resulting stabilization for a step by step disarmament and decrease of political tensions.

Stabilization appears to be possible today without a written treaty. Here we see that the technical means of war have become a language in which governments can

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talk and reckon with each other directly. Such unwritten agreements often are more effectual than written treaties. Of course, if no contract is written there is no legal barrier for any of the nations concerned to upset the present stabilization and acquire preponderance by developing new technical means, for instance weapons to counter ballistic missiles. When a contract is written, however, it must be taken into account that both sides will strive to the utmost to get one's own advantage legally fixed. Such a contract is tenable only if neither side feels cheated. We can say that it is built on the basis of distrust. An agreement is erected on the basis of the certitude that annihilation of the other will entail one's own annihilation. Thus in either case anxiety for one's own advantage and for one's own survival is utilized for the security of both sides.

What we have said, may be a reason for which agreements or treaties about weapons are more practicable nowadays than they formerly seemed. In the Cabinet wars of the 18th century the state which lost had to pay a province to the state which won. This is near the situation presupposed by the so-called "theory of games": what the one loses, the other wins. Today it is more likely that in case of war there will be only losers. It is more likely then that, induced by the common interest in survival, the opponents enter into agreements which increase the security of all.

Advancing this way, however, we come to a dead stop before arriving at world peace. "Arms control" may not go so far as to abolish the cause of the anxiety for one's survival. If the number of missiles in stalemate, which prevent aggression by fear of the deadly consequences, be reduced to such an extent that the consequences would no longer be deadly, one would have to prepare for dangerous new instabilities. Such a danger marks the zone of transition in which we live. The definite limitations of the military-technical concept of "arms control" can be overcome only when man will regard world domestic politics as matter-of-course.

Wiesner's model of the missiles stalemate endeavoured to make extreme deterrence, threatening vulnerable cities by invulnerable missiles, useful for the security on all sides. Politicians and strategists must, however, be prepared also for the ill-fated case that deterrence should fail.

The first theory on how to bring such a failure under control was the doctrine of "massive retaliation", proclaimed by Eisenhower, John Foster Dulles and Admiral Radford in 1953/54. On principle this doctrine allowed for variations, but in the end it settled on meeting any possible aggression by the strongest weapon. We need not picture here the consequences in case that weapon is the H-bomb. From the military point of view, this retailiation theory looks questionable since it can no longer work as a one-way street as soon as the soopoent has developed similar weapons to re-retaliate. From the point of view of the politician, the doctrine of "massive retaliation" means that as soon as deterrence has failed and the great war had broken out, the leading statesman must resign and leave the execution of the "thermo-nuclear apocalypse" to the military commanders who in turn have to follow a fixed program. The weapons themselves assume the control.

The doctrine of "massive retaliation", then, ends up with no control over the weapons at all. No wonder that a group of excellent American scientists and high military officers strongly objected to it. In the years 1954 to 1959, their protest resulted in the doctrine of "controlled response" (combined with "flexible response") Looking back into history, we may conclude that the doctrine of "massive retaliation would scarcely agree with the classical teaching on "righteous war", especially

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because the proportion of the repelled injuries to employed weapons is disregarded. The doctrine of "controlled response" reaches back to elements of this and of another classical teaching, namely that on the precedence of political over military authority. In order to keep responsible leadership capable of working, the new theory endeavours to guarantee the statesman's unbroken control of the military apparatus even in the worst case of an actual nuclear war. The theory of "controlled response" became military-political practice under Kennedy. "Flexible response" and "controlled response" put at the statesman's disposal military and political options for any imaginable conflict which vary according to the grievance of the case. Even the worst case allows for nothing but attacks on armed forces. The bulk of ballistic missiles is held back to prevent further actions of the opponent by making him consider the consequences for his own cities. An H-bomb "counterforce"-strategy will nevertheless mean millions of casualties among the civil population, and a "countercity"-strategy will multiply the casualties by ten.

The doctrine of "controlled response" doubtlessly is superior to the doctrine of "massive retaliation". But this must decidedly not be misunderstood as if nuclear war could ever be made a tolerable means to exert political power. "No exponent of this doctrine has suggested that strategic nuclear war could be made tolerable: what they have done is to refuse to despair" (Leonard Beaton). Desperation leaves catastrophe to its own dynamics. Responsible action finds possibilities in every situation to save human life. Instead of delivering control up to the weapons by a fixed programme of annihilation, there should be room for ever new political decisions during the course of a conflict. If decisions become necessary again and again, those who have to decide may take into consideration that the more human beings survive the conflict, the better for a re-building of civilization (Herman Kahn).

Human feeling shrinks away from applying concepts like "arms control" and "controlled response" to nuclear war. But thinking about the controlling of weapons is nowhere more necessary than here. This thinking is hard work and good work, and well deserves our respect. What those who work out the concepts did not consider, so it seems, is that the political structures on our earth have turned out irrational, unreasonable, the same as man's understanding of himself. Nobody can predict in which way man would be changed by the explosion of the first atom bomb or even the first H-bomb of a nuclear war. Maybe those for whose decisions reservation is so carefully made will be changed in a way that all chances to stop war are foiled. As to political structures, we can see already that nations are in a way broken at the peak of their power. They cannot use their big weapons. They cannot wage war but with subversive methods. In using these methods, they move outside International Law and Human Rights and thus leave the ground on which their own constitution is erected. They enter into unlawfulness and shut their eyes to that fact. The subversive methods could even loosen the restrictions preventing a big war. Such symptoms show that the concept of nation, as it had been worked out in the 19th and 20th centuries is irrevocably dissolving.

There can be no doubt: the merely technical concepts cannot master the dangers of our transitional situation. Their limitations cannot be overcome without political steps into new territory towards world domestic politics. New political concepts, in turn, presuppose men who are prepared to revise what has been taken for granted up to now.

In the first phase of the technical revolution, at the end of the 18th century, it was hopefully expected that the course of the scientific-technical evolution would

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break up the bond uniting the institution of the state and the institution of war and thus mediate eternal peace. Soon afterwards, the armies of the people surging up from the French Recolution demonstrated that democratic organizations were much more efficient in waging war than enlightened absolutism had been. What will we live to see in our times, at the beginning of the second phase of the technical revolution? Certainly the technical means today break up the system of traditional "foreign" politics. We are in the zone of transition to the full grown atomic age. This is a risky situation. We shall have to consider the possibilities it holds for us, whether we may give way to processes as they develop or seek to modify them by new political, scientific, even theological understanding in order to achieve peace.

V. On ethics in a scientific-technical world

1. Tasks for Christianity

We have shown how necessary it is to understand that the eschatological expectation does not excuse Christianity from being responsible for peace on earth, and at the same time not to mistake the relative pacification of conflicts, which would mark the era of world domestic politics, for the conclusive realization of the eschatological peace of God. The two ways of hoping for peace may neither be intermingled nor disconnected. We started with theological considerations and went on to concrete problems in the world. Now we have taken the opposite direction, starting with consideration of scientific-technical aspects of a coming world-community. We have to go on to ask what part Christianity, Christian faith, hope and charity and Christian theological-ethical insights may play.

Christianity believes that God, by His will to have man as a partner who turns toward Him unconstrainedly in love and worship, offers to the world the possibility to partake of His salvation. The Church in its existence, its preaching, and its sacraments bears witness to God's will to save. It corresponds to this will of God that Christianity strives for life and peace on earth, loving all men, even the enemy, as one's neighbour. The task of striving for life and peace in this world is certainly not reserved for Christians only. It is a task for all men in so far as reason destines them to come of age. Christianity must be ready to cooperate with all reasonable, responsible powers, without fear of being deprived of some specific priority. It is not Christianity's business to claim a priority here. The task of achieving world peace must make room for any initiative. Its solution even needs powers which are not yet here but must still grow.

In striving for world peace, Christianity has to prove itself free from self-centered concerns. To prove this means to devote oneself to what is to be done. The task has to be grasped as distinctly as possible, and the powers to tackle it have to be set free. To understand this kind of devotion, this reasonable service (Romans 12.1), as one of Christianity's concerns accords with many hopes and endeavours that are alive in the Ecumenical Movement. Of course there are only tentative beginnings as yet. None of us has yet acquired sufficient insights. The limited glimpses of the technical-scientific considerations which we have set forth in this paper can be summarized so that we see what Ecumenical Christianity might do.

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The axiom of "responsible society" summons us to pay more attention to the problems which science and technology raise up in our civilization. We cannot treat them as if they were of no concern to the core of human and Christian existence. The issue for today and tomorrow appears to be how to control power. We must realize that responsible control of power nowadays also means scientific control of science. To control the power of science, scientists will have to develop new, specific methods within the scientific-technical processes. Moreover, public information and discussion must be established for the control of this power. The most vital issues simply cannot be settled privately between scientific experts and politicians, military or economic leaders. Only a deeper understanding of the general process of science and technology can help to find the methods of control which are needed. This understanding will have to overcome both the "scientism", the uncritical belief in scientific progress as such, and the antagonism against science which is found among tradition-bound Christians too, who regard research as the destructive fruit of an autocratic, godless spirit.

Up to now, human control of those processes of changing the world which man himself started, is neither universal nor rational enough. The dynamics of science are about as irrational as the dynamics of civilization in general. Splendid rational methods are developed within individual sciences which lead them from success to success. At the same time, these sciences seem to lose the ability to cooperate with other sciences in a methodologically clear way. Special sciences are like foreigners to each other who cannot talk sense together. They behave as if it has never occurred to them that they could cooperate in a rational way. This is an illustration of the rather disquieting possibility that to be content with rationality in the particular can induce toleration or even ignorance of the irrational in the whole. We have to realize our responsibility for science in general, as a universal power.

If we look back into the history behind modern technology and science, we can distinguish now that even in the so-called "pure" science man's will to dominate was one of the main motives. This will to dominate made nature as a whole, including man as a natural being, an object of cognition and wilful alteration. Man has learned better and better to supervise the world of objects. He has not yet learned to regard correspondingly the lord of that world, scientific reason. Its realm is limited to that which it knows. Correspondingly it is limited itself, as the world is. It is an illusion to regard it as unrestricted. To be lord of the world of objects means both a definite power and a definite responsibility.

The doctrine of the boundless ability to make all things objects is an example of yesterday's decisions directing our way today. It grew from a mixture of Greek and Christian elements. For three centuries past it gained more and more influence in the world. Now the Copenhagen interpretation of the quantum theory has relativized it. In the time of early capitalism in Europe, the belief in the power to objectivize all things made man treat man's working power as mere merchandise. In the meantime something has been done about the worst excrescences of such would-be almightiness. The one-sidedness of this doctrine, however, continues to bring forth questionable consequences. Thus the doctrine blindfolds us to the possibilities which will come with the evolution of science and technology to put the process under human control. Christianity might watch that these possibilities are not overlooked again and again. Theology can help here only in cooperation with those in whose fields the possibilities arise, or with philosophy in the largest sense. It cannot help if it does not review the decisions which led to its present way of thinking. Theology which believes in the methods of the present sciences so far as to accept the doctrine of

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objectivation without reflecting upon it critically will scarcely help.

Besides all these cooperative tasks, the one task for Christians remains: to be messengers of God's peace in a mankind torn by mutual injuries and the urge for retaliation.

2. Complementary action

The ambiguity of our scientific-technical world urges Christianity to activate the gift of interpreting our situation in history, the gift of discerning the signs of the time and of discriminating between the spirits. Otherwise we can neither see nor utilize the possibilities to decide responsibly for that part of the future which is given into our hands. The situation being an ambiguous one, we have to feel our way in the dark. We do not know where on earth the way may end according to God's will. We cherish illusions if we pretend to know God's ends in the world. Therefore we must be prepared that the way in which we should act might not be a straight one aiming at an unmistakable value. More today than hitherto responsible acting appears to be at one time a decided advance along a certain line and at another time to involve resistance to such an advance. The following examples illustrate what may be called the ethics of complementary action.

Christianity should definitely promote science and technology for the sake of one's neighbour and his survival. It should cooperate in a generous effort of social and scientific education on a large scale, in order to instruct as many as possible in the best possible way. However, the greater the number of people occupied with science, the easier to mistake the scientific-technical progress for a determined evolution which eventually will sweep man away. We should provide for education, which teaches the historical and philosophical consideration of what one is doing, along with the skill of managing the scientific-technical means of today and tomorrow. Such educational institutions are not only necessary in the European-American area where modern science and technology started, but in Asia and Africa as well.

Stabilization by mutual deterrence between nations which are prepared to annihilate each other within a couple of minutes does not offer great security. It appears rather probable that political crises will start a war, maybe even a global war. We must find a way to change the present political situation. Christianity can act in two ways to exemplify the future peace-order of the world. It can be with those whose conscience makes them deny military service, thus showing that there is no longer any room for war in civilization. But Christianity can also counsel those who conscientiously think it indispensable for stabilization during the period of transition to have weapons of annihilation ready. Hoping for God's coming reign of peace that we do not see, Christianity has wide unobstructed scope to encourage those who endeavour to change the present situation, in so far as it is dangerous, and to resist those who try to keep or change in a dangerous way processes or conditions as they are today.

Appendix.

World-wide science as a field of the Ecumenical Movement.

When C.F. von Weizsäcker was given a reward for endeavours toward peace in 1963, he made the following statements : World peace requires of us an extraordinary moral exertion. We have to work out new ethics for living in a technical world. In considering this task it is evident to us that the New Testament is the most revolutionary book we have. This book is not all out of date. The New Testament ethics of loving one's neighbour will have to be the foundation of ethics in our technical world.

The Ecumenical Movement has a unique opportunity to contribute. The individual churches in it belong to particular nations and systems of society; they are bound to particular frames of reference. The structure of the Ecumenical Movement corresponds to a coming world community. It has to view the world from a higher position and see more than the particular aspects. The universal future of world civilisation can be its specific theme.

Science and technology put new dynamics into civilisation. If they continue to do it in an irrational way, the process of civilisation remains uncontrollable. If, however, we reach a deeper understanding of science and technology as responsible for their own changing of the world, an actual step towards life in a coming world community will have been taken. Certainly it is only a single step on only one of the many necessary ways. But a vital step nevertheless.

There are men all over the world who ponder over this task, and there are already several institutions who scientifically deal with peace To make progress on this way is difficult. There remains little time to provide for the most elementary conditions of peace in a coming world community. If armament gets out of balance, or weather manipulation falls into the hands of one power only, the chance to establish a reasonable order of peace might be gone with the outbreak of an atomic war. It is probable that some of the present attempts toward such an order will bogdown in more or less superficial improvisations and illusions. Though it is difficult, we nevertheless must attain adequate scientific methods and institutions.

Here is an opportunity for all kinds of churches assembled in the World Council, traditional peace churches as well as others, to contribute in their specific way to a solution of the task. The Ecumenical Council is the only authority which can gather the individual attempts that have been made in protestant and other churches and which can pursue and complement them cooperatively. Can the existing administration do this ?

The step must be taken on the level of basic research. We need the cooperation of sciences as one of the preconditions of life in a technical world, of a life in which human ethics are realizable. Basic research in scientific cooperation requires an institution like a study center or a specialized university. An Ecumenical institution which deals with methods and results of cooperation between the sciences gathered for peace research

might be founded. Within the scope of the present paper we cannot sketch concretely how such an Ecumenical "peace university" might work and look. It might be a symbol from which to see that Christian hope is a realiaty, something for our present world. If Christianity would grasp what can be done here, the means might come to establish and run such an institution.

Even to provide for the external conditions of such research toward peace as the condition of life in the technical age would mean an exertion lasting for years. However, if it is done, young scientists of many branches of science from all churches could cooperate in collecting, clarifying and integrating results of research from all over the world; and suggestions and propositions could be sent out to be worked at. The General Assembly of the Ecumenical Council is going to formulate in 1968 a Christian reply to the technical and social revolution of our time. Many organizations of the Ecumenical Council of Churches have been at work on these problems for a long time. The Second Vatican Council has brought into close contact all Catholic endeavours to review the attitude of the Roman church toward modern world. It seems to us that the manifold Ecumenical initiatives could be concentrated and intensified in an institution in which scientists from many fields together with theologians could cooperate towards a solution of the task of peace. Christians could contribute to what is needed in the revolution of civilization today by such a step.

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